REPORT OF MARY DUNN BAKER, Ph.D.

VIVIAN BERT, et al., v. AK STEEL

UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF OHIO
WESTERN DIVISION

CASE NO. C-1-02-467

Judge Sandra S. Beckwith
Magistrate Judge Timothy S. Hogan

ERS Group
Tallahassee, Florida
May 25, 2005

I. INTRODUCTION

Assignment. At the request of Counsel for AK Steel (the Company), I was asked to review and evaluate Dr. Edwin L. Bradley's April 18, 2005 report entitled "Supplemental Expert Report Regarding Hiring Into Laborer Positions at Middletown Works and Ashland Works of AK Steel." In addition, I was asked to prepare my own statistical analyses of the Company's relevant hiring decisions, if appropriate.[1]

Summary of Dr. Bradley's Opinion. In his report, Dr. Bradley describes the results of his analyses of the racial composition of Middletown laborer[2] hires who applied during the period 1/1/2000 - 10/29/2003 and Ashland laborer hires who applied from 10/24/2000 - 9/17/2002. Based on these analyses, he asserts that AK Steel hired statistically significantly fewer African-Americans than would be expected if the hiring process was neutral with respect to race.

Summary of My Opinion. In my opinion, Dr. Bradley's Middletown and Ashland analyses produce misleading results because he:

- includes applicants and hires who applied and who were hired into laborer jobs prior to the relevant study period for this case;[3] and
- uses an inappropriate statistical method.

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[1] This report is based on the information available to date. Should additional data become available or other issues arise, I may revise or supplement this report.

[2] Laborer is the entry-level position for all bargaining unit jobs in the Middletown and Ashland steel mills. Laborers work in all parts of both mills, doing many different types of jobs. Some of the laborer tasks are complex and are performed in a potentially hazardous environment. Because the consequences of poor performance can be dire, hiring qualified applicants is key to ensuring the safety of the Company's employees.

[3] Counsel for AK Steel advised me that the start date for the relevant study period is August 12, 2001.

His Ashland analysis is further flawed because he did not correctly count the number of applicants for and hires into Ashland laborer jobs. Specifically, he

- did not count as hired some Ashland applicants who were, in fact, hired into laborer jobs during the time period that he studied; and
- includes some applicants who were not considered for laborer jobs, but who were hired into skilled positions such as crane operator and electrician.

In addition, the shortfall that Dr. Bradley's Middletown analysis yields is exaggerated because he includes some applicants who could not have been hired by AK Steel. Specifically, he includes Middletown applicants who:

- withdrew from the hiring process on their own accord; and
- would have been hired, but became ineligible for hire after they failed to successfully complete the background check or the physical exam.[4]

Analyses do not reveal a statistically significant pattern of under-hiring African-Americans for laborer positions when the study covers the appropriate time period, uses the appropriate statistical technique, excludes Ashland applicants who were hired into non-laborer positions, uses the correct number of Ashland laborer hires and considers the fact that some Middletown applicants were not hired because they withdrew from the

[4] At page 9 of his report, Dr. Bradley states that he "cannot analyze separately the components of the selection procedure used for hiring into the Laborer positions at AK Steel" because, at deposition, Ms. Lester and Ms. Short indicated that they did not have complete information about the results of the screening process, reasons why an applicant did not take the test, etc. While documentation regarding the various stages of the hiring process is not available for Ashland, the Middletown documents provided to Dr. Bradley do contain information sufficient to conduct analyses of each step of this facility's hiring process. The Middletown documentation includes the results of the screening process and information about who did and did not take the test, as well as the test result for test-takers. It includes information about who was and was not interviewed and the result for those who were interviewed. The Middletown documentation also shows who was and was not referred for a background check and physical exam and the outcomes of these steps. Furthermore, the Middletown documents allow for the identification of applicants who withdrew and when they withdrew from the hiring process. The fact that Ms. Short (AK Steel General Manager of Human Resources, previously Middletown Human Resources Manager) did not have personal knowledge of such things as the reason that an applicant failed to take the test does not mean that Middletown data are not sufficiently complete to analyze each stage of this facility's hiring process.

hiring process or became ineligible for hire. In fact, such studies show that the outcome of AK Steel's laborer hiring is consistent with the result of the race-neutral model.

Credentials. I am a labor economist with extensive experience in statistical analyses of employment practices and in the computation of economic loss estimates. I completed the Ph.D. in Economics at Florida State University in 1986. Since July 1986, I have been employed by Economic Research Services Group (ERS) in Tallahassee, Florida. ERS is a research and consulting firm whose professionals work with individuals, government agencies, colleges and universities, corporations and other organizations to analyze employment decision-making processes and to compute estimates of the value of alleged economic losses. I have testified in federal courts and other judicial settings about statistical analyses and economic loss estimates that I have prepared on behalf of both plaintiffs and defendants. For the last several years, I, along with other Ph.D. economists at ERS, have presented seminars on the economics and statistics of employment discrimination and the computation of the value of losses resulting from a variety of events and actions. State bar associations offer continuing legal education credit for attending the ERS seminars. In addition, on many occasions, I have been invited by organizations such as the Florida Bar Association, the American Association for Affirmative Action and the U.S. Department of Labor's Office of Federal Contract Compliance Programs (OFCCP) to give lectures and conduct workshops on statistical analyses of employment issues and the valuation of economic losses. Appendix A provides an outline of my credentials and the cases in which I have given testimony over the last four years.[5]

[5] ERS charges $350 an hour for the time that I spend on this matter and $90 - $300 per hour for the services that my staff provides.

II. DATA AND DOCUMENTS

In addition to Dr. Bradley's report, the primary data and documents upon which I relied to prepare this report are outlined below.

1. Complaint – Class Action filed on June 26, 2002;
2. An electronic Ashland applicant flow log [Ashland Summation Database (W0425161).XLS];
3. An electronic list of new hires into laborer positions at Ashland [april25fileofnewhires8a8bforattorney.xls];
4. A DVD containing scanned images of Ashland employment applications;
5. An electronic Middletown applicant flow log [Database for Mary Baker (W0389100).XLS];
6. Nine CDs containing scanned images of Middletown employment applications;
7. A revised electronic Middletown applicant flow log [AK Bert Middletown Data Base (W0423915).XLS];
8. An electronic list of new hires into Middletown laborer jobs [HIRE.DATA.XLS];
9. pdf files containing scanned images for three new Middletown laborer hires whose names were not shown on the applicant flow log [mcintyre.pdf, sweet.pdf, and washingt.pfd];
10. The transcripts of the February 16, 2005 depositions of Ms. Phyllis Short (AK Steel General Manager for Human Resources, previously the Middletown Manager of Human Resources) and Ms. Susan Lester (Ashland Manager of Human Resources);
11. An electronic file containing the zip codes of the currently active Ashland union employees [tackashlandhourly042505.xls];[6]
12. 2000 Census data regarding the racial composition of individuals who work in laborer and helper jobs (EEO-1 category 8) in the Huntington-

[6] The zip codes were used to identify the counties in which the Ashland union employees live.

Ashland Metropolitan Statistical Area (MSA)[7] and the counties in which the Ashland laborer hires live;[8]

13. Use of Statistics in Equal Employment Opportunity Litigation by Connolly, Peterson, Connolly and Zesch published by the Law Journal Press (2004 edition); and

14. The Statistics of Discrimination, Using Statistical Evidence in Discrimination Cases by Paetzold and Willborn (Clark, Boardman, Callaghan, 1996).

The analytic files that ERS constructed to prepare the Ashland and Middletown analyses described herein were compiled using items 2 - 9, as well as the Company's responses to data questions.[9]

III. CONCEPT OF STATISTICAL SIGNIFICANCE

In a race-neutral hiring process, the expectation is that African-American applicants will be selected for laborer positions in proportion to their representation among applicants for the job, assuming that African-American and non-African-Americans are similarly situated in all relevant respects (such as possessing comparable qualifications and pursuing the hiring process with equal diligence). Therefore, the expected number of African-American laborer hires is computed by multiplying the total number of selections by the percent African-American among similarly situated applicants.[10]

If the actual number of African-American hires falls short of the predicted number, then the number of standard deviations of the difference is computed to

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[7] The Census data for the Huntington-Ashland WV-KY-OH MSA is provided at Appendix B.
[8] The Census data for Laborers and Helpers in the relevant counties is provided at Appendix C.
[9] The analytic files differ from the electronic applicant data files provided because erroneous entries were corrected and missing data elements were entered where possible. For example, erroneous race codes were corrected and some missing race codes were entered.
[10] If the applicants included in the analysis are not similarly situated, then the demographic group availability rate and the expected number of selections will be erroneous.

determine whether the observed difference is "too large" to be consistent with the race-neutral outcome. Generally, social scientists and the courts conclude that when the actual number of African-American selections falls approximately two [technically, 1.96] or three standard deviations short of the expected number, the observed difference is not likely to be attributable to random variation in a neutral environment.[11] Such differences are considered *statistically significant* and generally provide statistical support for the allegations of discrimination (provided that the applicants are similarly situated in all relevant respects and the model reflects the reality of the decision-making process).[12]

When the actual number of African-American hires is within two or three standard deviations of the expected number, social scientists and the courts typically conclude that the difference is likely to be attributable to chance and that the outcome is consistent with the race-neutral result. Differences that are less than two or three standard deviations are considered *statistically insignificant* and fail to provide statistical support for allegations of discrimination.

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[11] For examples of courts' interpretations of the results of statistical analyses, see *Hazelwood School District v. United States* [433 U.S. 299; 97 S.Ct. 2742 (1977)] and *Palmer v. Shultz* [815 F.2d 84, 97 (D.C. Cir. 1986)]. In Dr. Bradley's opinion, the threshold for statistical significance is 1.645 standard deviations, rather than 1.96, or approximately two. In the *Palmer* opinion, the court explains why the "two or three standard deviation rule" should be used for purposes of determining statistical significance. This issue is also discussed in Use of Statistics in Equal Employment Opportunity Litigation by Connolly, Peterson, Connolly and Zesch. Appendix D provides the relevant excerpt from this text.

[12] Statistically significant differences may be caused by non-racial factors for which the analysis did not account. This will occur when the demographic groups whose outcomes are compared are not similarly situated. The importance of considering other non-racial factors when interpreting the results of statistical analyses is addressed in The Statistics of Discrimination, Using Statistical Evidence in Discrimination Cases by Paetzold and Willborn. Appendix E provides the relevant excerpt from this text.

IV. FLAWS IN DR. BRADLEY'S ANALYSES OF LABORER HIRES BY RACE

The time period covered by Dr. Bradley's analyses begins on January 1, 2000. According to Counsel for AK Steel, the start date of the relevant study period in this case is August 12, 2001. Therefore, Dr. Bradley's analyses include some hiring decisions that were made prior to the relevant time period.

Dr. Bradley used the hypergeometric method to compute the number of standard deviations between the actual and expected number of African-American hires. This method is appropriate when the actual applicant pool for each selection (or set of selections)[13] is known and the analysis is conducted on a decision-by-decision basis (to account for variation in the racial composition of applicant pools from one point in time to another). While actual applicant data are available for the period that he studied, the particular applicants who were actually considered for each vacancy (or set of vacancies) is unknown.[14] Because Dr. Bradley used the percent African-American among all applicants of known race who applied at Middletown over the period 1/1/2000 - 10/29/2003 and who applied at Ashland during the period 10/24/2000 - 9/17/2002 as an approximation of African-American availability for each vacancy (or set of vacancies) at the respective facilities, his choice of the hypergeometric method to analyze the data is inappropriate. Instead, he should have used the binomial method.[15]

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[13] "Set" of selections or vacancies refers to specific points in time at which more than one hiring decision was made.

[14] Therefore, the analyses cannot be conducted on a vacancy-by-vacancy basis.

[15] The binomial method should be used when a proxy for a demographic group's availability rate for a given selection is used.

Another reason that the binomial should be used in this case is that the race of some applicants is unknown. The assumption underlying Dr. Bradley's analysis is that the racial composition of applicants of unknown race is approximately the same as the percent African-American among applicants of known race. According to Dr. Bradley's report, the race of 4.2% (6.4%) of the Middletown (Ashland) individuals who applied during the time frame that he studied is unknown.

In his analysis of Ashland hires, Dr. Bradley includes some applicants who were hired into positions other than laborer such as crane operator and electrician. As these applicants were not considered for laborer jobs, they should not be included in the analysis.[16]

Moreover, as Dr. Bradley's Ashland analysis does not include applications that were submitted after September 17, 2002, he did not use all of the available Ashland data for the relevant time period. In his report, Dr. Bradley states the applications with dates after September 17, 2002 could not be used for analysis because it was not clear who among these applicants was ultimately hired and the race of more than 30% of the applicants was unknown.[17]

In my opinion, the post-September 17, 2002 Ashland applicant data can be used for analysis for two reasons. First, AK Steel can identify new hires into Ashland laborer positions.[18] Via the Company's response to a request to provide a list of new hires into Ashland laborer jobs over the time period for which application data was produced, ERS was able to identify the applicants who were actually hired into relevant jobs.

Second, while the race of more than 30% of the individuals who applied at Ashland after September 17, 2002 is unknown,[19] in this case, my opinion is that the race data that are available should not be ignored as there is no reason to believe that the use of this information would result in an understatement of African-American representation among applicants for these jobs. As shown below, the percent African-American among the individuals of known race who applied for an Ashland laborer job during the period

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[16] I am informed that rejected applicants for skilled positions were considered for laborer jobs.
[17] See page 7 of Dr. Bradley's Supplemental Expert Report.
[18] At deposition, Ms. Lester testified that she could provide a list of all laborers who were hired since January 2000.
[19] See page 7 of Dr. Bradley's report.

August 12, 2001 - December 31, 2003 is 4.6%. This African-American availability rate is substantially higher than the percent African-American among individuals who work in laborer jobs in the relevant local labor market.[20] According to the 2000 U.S. Census, African-American representation among workers in laborer occupations in the MSA in which Ashland is located is 2.00%.[21] African-American representation among laborers in the counties in which most of the Ashland union employees live ranges from 0.00% to 1.42%.[22] Given these local labor market availability rates, the use of the Ashland applicant race data that are available is not likely to understate the rate at which African-Americans actually applied for these jobs.

Dr. Bradley's Middletown hiring analysis includes all applicants of known race who applied for a laborer job. Middletown documents show that some of these individuals withdrew their applications during the hiring process.[23] As individuals who voluntarily withdrew from the hiring process could not have been hired, these applicants should be excluded from the analysis. His inclusion of applicants who withdrew results in an exaggeration of the magnitude of the Middletown shortfall in African-American hires.

The Middletown data and documents also identify the applicants who were referred for a background check. According to Ms. Short's deposition testimony:

- applicants who passed the background check received a conditional offer of employment and those who passed the physical exam were hired; and

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[20] In the absence of actual race data, labor economists often estimate the availability of a demographic group for an occupation (or set of occupations) using U.S. Census data for the relevant local labor market.
[21] Ashland is located in the Huntington-Ashland, WV-KY-OH MSA. See Appendix B.
[22] Ashland's union employees live in 17 different counties. Nearly 80% of these live in Boyd County, KY, Carter County, KY, Greenup County, KY and Lawrence County, OH. See Appendix C.
[23] Ashland applicants who voluntarily withdrew from the hiring process cannot be identified.

- those who did not complete or pass the background check or the physical exam were not eligible for hire.

Although Dr. Bradley had the data to determine which Middletown applicants were referred for a background check and a physical exam, he chose not to consider this important information.[24] Therefore, in his Middletown analysis, some of the unsuccessful applicants were not eligible for hire because they did not pass the background check or the physical exam. Because African-American applicants who were subject to the background check and/or the physical exam were less likely than others to successfully complete these steps, his failure to consider this phase of the hiring process results in an inflated Middletown shortfall in African-American hires.

V. ALTERNATIVE ANALYSES OF THE RACIAL COMPOSITION OF LABORER HIRES[25]

Ashland Analysis.[26] As Table 1.a shows, during the period August 12, 2001 - December 31, 2003, 1,080 applications were submitted for Ashland laborer jobs by individuals of known race. Forty-nine (or 4.5%) of these applications were presented by African-Americans.[27]

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[24] The Ashland data do not allow for the identification of applicants who were referred for a background check or physical exam.

[25] All of the analyses described in this section are conducted using the binomial method. Duplicate applications are excluded from the analyses.

[26] The Ashland analysis excludes 45 duplicate applications, 821 applications submitted by individuals of unknown race and 109 applicants who were hired into skilled positions.

[27] At Table 1-A in his report, Dr. Bradley shows that the percent African-American among Ashland applicants for the period 10/24/2000 - 9/17/2002 is 8.65%. Apparently, his analysis was conducted using the Ashland data initially provided. Subsequently, additional Ashland data were produced. My research using all of the available Ashland data indicates that approximately four percent of the individuals who applied for laborer jobs during this period are African-American. This African-American representation rate is similar to the percent African-American among those who applied after September 17, 2002.

Ashland hired 115 of these applicants into laborer jobs. Therefore, the expected number of African-American hires is approximately five (5.2 = 115 x 0.045). Table 1.a reveals that nine of the hires are African-American, or approximately four more than expected. Clearly, the Ashland data available for the relevant time period do not provide statistical support for the allegation that the Company under-selected African-Americans for these laborer jobs during the relevant time period.[28]

Middletown Analyses.[29] Table 1.a shows that, over the period August 12, 2001 - December 31, 2003, 4,084 applications for Middletown laborer jobs were presented by individuals of known race and were not withdrawn during the hiring process.[30] Approximately 8.9% (364) of these applications were submitted by African-Americans.

During this period, Middletown hired 417 laborers. Therefore, the statistical expectation is that approximately 37 (37.2 = 417 x 0.089) of these hires would be African-American. The data show that 25 of the 417 hires are African-American, or about 12 fewer than predicted. As the number of standard deviations of this difference is -2.09, this 12 person shortfall exceeds two, but not three, standard deviations.[31] Had

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[28] This analysis includes all *applications* (excluding duplicates) presented by individuals of known race during the study period. Some applicants submitted multiple applications during the relevant time frame. Table 1.b reports the results of an analysis of the racial composition of Ashland laborer hires that includes only one application per person. As Table 1.b shows, this analysis also reveals that Ashland hired a larger number of African-Americans than would be expected given their representation among applicants.

[29] The Middletown analyses exclude 175 duplicate applications, 205 applications submitted by individuals of unknown race and 322 applications that were withdrawn. During the study period, nearly ten percent of African-American applications were withdrawn, while only approximately seven percent of the applications submitted by others were withdrawn.

[30] The 4,084 includes applications that were "screened out" by AK Steel and applications submitted by individuals who did not pass the test; were not interviewed; did not pass the interview; and failed the background check or the physical exam.

[31] This analysis includes all *applications* (excluding duplicates) presented by individuals of known race that were not withdrawn during the hiring process. Table 1.b reports the results of an analysis that includes only one application per person. As Table 1.b shows, this analysis reveals that the difference between the actual and expected number of African-American hires is more than two, but not three, standard deviations.

Middletown hired one additional African-American, the number of standard deviations of the shortfall would have been less than two.

As discussed below, approximately 1/3 of the observed Middletown shortfall is attributable to the fact that a larger percentage of African-American applicants than others became ineligible for hire because they did not pass the background check or the physical exam. As explained above, applicants who passed the interview were subject to a background check. Those who passed the background check were given a conditional offer of employment and were hired if they subsequently passed the physical exam. Therefore, if African-American applications are referred for a background check in numbers consistent with their representation among all applicants who did not withdraw prior to the background check step, then any significant difference between the actual and expected number of African-American hires is the result of African-Americans withdrawing applications after the background check or failing the background check or physical exam at a higher rate than others.

As Table 2.a shows, the Middletown data reveal that there were 4,125 applications that had not been withdrawn prior to the background check step.[32] [The 4,125 includes the applications that were "screened out" by AK Steel, as well as applications that were submitted by individuals who did not pass the test, who were not interviewed and who did not pass the interview.] Out of the 4,125, 728 were referred for a background check.[33] Since approximately 8.9% of these 4,125 applications were submitted by African-Americans, the expectation is that about 65 (64.8 = 728 x 0.089) of

[32] This number of applications (4,125) is larger than the number shown on Table 1.a (4,084) because some of the 4,125 applications were withdrawn after the background check step.
[33] This analysis includes Middletown applicants who withdrew after being referred for a background check and excludes those who withdrew before this point in the hiring process.

the applications referred for a background check would belong to African-Americans. In fact, 57 of the applications that were subject to a background check were from African-Americans, or about eight fewer than expected. As the number of standard deviations of this difference is less than two (-1.01), this outcome is reflective of the result of a process that is neutral with respect to race.[34] Accordingly, the slightly more than two standard deviation Middletown hiring shortfall is explained by the fact that African-Americans were more likely than others to fail the background check and physical, and, as a result, to become ineligible for hire.

Aggregation of the Results of the Ashland and Middletown Analyses. Table 1.a shows that when the results of the Ashland and Middletown hiring analyses are aggregated, the expected number of African-Americans selected during the period August 12, 2001 - December 31, 2003 is approximately 42. The number of African-Americans actually selected was 34, or about eight fewer than expected. As the number of standard deviations of this eight person shortfall is -1.35, this difference is not statistically significant. Therefore, the AK Steel data fail to reveal a pattern of under-selecting African-Americans for laborer jobs during the relevant time period.

Furthermore, as Table 2.a shows, the aggregation of the results of the Ashland hiring analysis and the Middletown analysis of selections for the background check shows that, over the relevant time period, the aggregate shortfall in African-American hires is approximately four. As the number of standard deviations of this four person shortfall is -0.50, this difference is not statistically significant. Again, the AK Steel data

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[34] This analysis includes all *applications* (excluding duplicates) that were submitted by individuals of known race and that were not withdrawn prior to the background check phase of the hiring process. Table 2.b reports the results of an analysis that includes only one observation per person for applicants who did not withdraw prior to the background check phase of the hiring process. As Table 2.b shows, the African-American shortfall in referrals for the background check is not statistically significant.

fail to reveal a pattern of under-selecting African-Americans for laborer jobs during the relevant time period.

VI. SUMMARY

The results of Dr. Bradley's analyses are not helpful to the fact-finder in this case because he includes successful and unsuccessful applicants who applied prior to the relevant time period; used an inappropriate statistical method; did not correctly count Ashland laborer hires; and ignored the fact that some Middletown applicants voluntarily withdrew from the hiring process or became ineligible for hire because they did not successfully complete the background check or the physical exam. Analyses that include applications submitted during the period August 12, 2001 - December 31, 2003; use the appropriate statistical method; correctly count Ashland applicants and laborer hires; and consider the fact that some Middletown applicants could not have been hired because they withdrew or did not pass the background check or physical exam; show that the outcome of AK Steel's laborer hiring decisions is consistent with the result of a race-neutral hiring process. The data reveal that, at Ashland, a larger number of African-Americans were hired into laborer positions than would be expected. At Middletown, the slightly more than two standard deviation shortfall in laborer hires is explained by the fact that African-Americans were more likely than others to become ineligible for hire at the background check or physical exam phase of the hiring process. Accordingly, when the results for Ashland and Middletown are aggregated, the data fail to reveal a significant pattern of under-selecting African-Americans for laborer jobs. Therefore, the results of these analyses do not provide support for Plaintiffs' allegation that African-

Americans were hired for laborer jobs in significantly fewer numbers than expected in a race-neutral setting.

Mary Dunn Baker, Ph.D.

May 25, 2005
Date

Table 1.a
Analysis of the Racial Composition of Laborer Hires
All Applications Submitted August 12, 2001 - December 31, 2003

Location	Total Number of Applications with Known Race	Number of African-American Applications	Percent African-American Among Applications	Total Number of Hires	Expected Number of African-American Hires	Actual Number of African-American Hires	Difference Between Actual and Expecled	Binomial Number of Standard Deviations
Ashland[1]	1,080	49	4.54%	115	5.22	9	3.78	1.69
Middletown[2]	4,084	364	8.91%	417	37.17	25	-12.17	-2.09
				532	42.38	34	-8.38	-1.35

[1]The Ashland analysis excludes 45 duplicate applications, 821 applications submitted by individuals of unknown race and 109 applications submitted by individuals who were hired into non-laborer positions.

[2]The Middletown analysis excludes 175 duplicate applications, 205 applications submitted by individuals of unknown race and 322 applications that were withdrawn during the hiring process.

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Table 1.b
Analysis of the Racial Composition of Laborer Hires
Applications Submitted August 12, 2001 - December 31, 2003
One Application Per Applicant

Location	Total Number of Applicants with Known Race	Number of African-American Applicants	Percent African-American Among Applicants	Total Number of Hires	Expected Number of African-American Hires	Actual Number of African-American Hires	Difference Between Actual and Expected	Binomial Number of Standard Deviations
Ashland[1]	1,006	46	4.57%	115	5.26	9	3.74	1.67
Middletown[2]	3,749	337	8.99%	417	37.48	25	-12.48	-2.14
				532	42.74	34	-8.74	-1.40

[1]The Ashland analysis excludes 789 applicants of unknown race and 109 applicants who were hired into non-laborer positions.

[2]The Middletown analysis excludes 205 applicants of unknown race and 284 applicants who withdrew during the hiring process.

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Table 2.a
Analysis of the Racial Composition of Middletown
All Applications Referred for Background Check and Ashland Hires
Applications Submitted August 12, 2001 - December 31, 2003

Location	Total Number of Applications with Known Race	Number of African-American Applications	Percent African-American Among Applications	Total Number Referred (Hired)	Expected Number of African-American Referred (Hired)	Actual Number of African-American Referred (Hired)	Difference Between Actual and Expected	Binomial Number of Standard Deviations
Ashland[1]	1,080	49	4.54%	115	5.22	9	3.78	1.69
Middletown[2]	4,125	367	8.90%	728	64.77	57	-7.77	-1.01
				843	69.99	66	-3.99	-0.50

[1]The Ashland analysis excludes 45 duplicate applications, 821 applications submitted by individuals of unknown race and 109 applications submitted by individuals who were hired into non-laborer positions.

[2]The Middletown analysis excludes 205 applications submitted by individuals of unknown race and 281 applications that were withdrawn prior to the background check.

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Table 2.b
Analysis of the Racial Composition of Middletown
Applications Referred for Background Check and Ashland Hires
Applications Submitted August 12, 2001 - December 31, 2003
One Application Per Applicant

Location	Total Number of Applicants with Known Race	Number of African-American Applicants	Percent African-American Among Applicants	Total Number Referred (Hired)	Expected Number of African-American Referred (Hired)	Actual Number of African-American Referred (Hired)	Difference Between Actual and Expected	Binomial Number of Standard Deviations
Ashland[1]	1,006	46	4.57%	115	5.26	9	3.74	1.67
Middletown[2]	3,789	340	8.97%	724	64.97	55	-9.97	-1.30
				839	70.23	64	-6.23	-0.78

[1]The Ashland analysis excludes 789 applicants of unknown race and 109 applicants who were hired into non-laborer positions.

[2]The Middletown analysis excludes 205 applicants of unknown race and 250 applicants who withdrew during the hiring process.

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